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CURRENT LITERATURE.

BOOK REVIEWS.

Cyanophyceæ and bacteria.

DR. ALFRED FISCHER has made further investigations into the structure of the Cyanophyceæ and bacteria.[1] He admits that Bütschli's central body cannot be explained as contracted cell contents, but insists that there is no such sharp line between central body and "Rindenschicht" as Bütschli figures. The analytical value of staining is thoroughly discussed. The author stained substances of known chemical composition, and came to the conclusion that the coloring does not depend upon a chemical union between the stain and the tissue elements, but is rather a physical phenomenon and does not determine the relationships of albuminoid bodies or the morphological values of cell elements. Fischer claims that Bütschli was mistaken in the assumption that digestion experiments support the theory that the central body is a nucleus. The green rind of the cyanophyceous cell is a genuine chromatophore and can be isolated by reagents. He was not able to demonstrate a layer of protoplasm between the chromatophore and cell wall, but believes that plasmolytic phenomena and the collecting of granules along the cross walls indicate such a layer. The ground mass of the central body is nothing but the principal part of the protoplast which is surrounded by the chromatophore. Very often the ground mass stains only slightly deeper than the chromatophore and cannot be compared with a nuclear network. The ground mass of the central body does not take any part as an independent organ either in cell division or in spore formation. Nor do the granules play any characteristic part during division. In short, there is no nucleus or organ which resembles a nucleus in the Cyanophyceæ, nor is the central body a phylogenetic forerunner of the nucleus of higher forms.

In treating of the sulfur bacteria it is found that, contrary to Bütschli's description, there is no colored rind and colorless central body in Chromatium, but the coloring material is uniformly distributed. Consequently there can be no comparison with the Cyanophyceæ in this respect. Among the sulfur bacteria the central body is found only in individuals which are free from sulfur, and in sulfur-free Chromatium a central body cannot be demonstrated. There are granules in Chromatium and in Beggiatoa which stain red with haematoxylin, but they cannot be called chromatin on such evidence. There are no genuine nuclei in the sulfur bacteria.

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[1] FISCHER, ALFRED.—Untersuchungen über den Bau der Cyanophyceen u. Bakterien. 8vo. pp. —. Jena: G. Fischer. 1897. *M.* 7.

In dealing with the genuine bacteria, the theory that bacteria are nuclei without cytoplasm is regarded as unfounded. After the best fixing agents neither Spirillum nor other bacteria show clear, less deeply staining ends. Bütschli's central body is nothing but the entire protoplast contracted by the plasmolysis of preparation. The contents of the bacterium cell consist of a lining of protoplasm along the wall and a central cavity which in elongated forms is chambered by protoplasmic septa. Present methods fail to demonstrate a nucleus. The more deeply staining granules are not nuclei, or chromatin granules. The relationship of the sulfur bacteria and all other bacteria to the Cyanophyceæ is merely one of loose, superficial morphology. They stand in closer relation to the Flagellatae.

Microtome sections from paraffine material were stained in the most approved manner, and the technique throughout was thoroughly up to date. The plates are exceptionally elegant, aud doubtless show what there is to be seen.—CHAS. J. CHAMBERLAIN.

A laboratory manual.[2]

SUCH is the name given to a little book by Principal Charles H. Clark, of Windsor Hall School. It seems to be the author's idea to furnish a large amount of suggestive material, from which work may be obtained either for elementary or more advanced courses; and he follows, as he states, "the lines suggested in the Report of the Committee of Ten." As the reviewer prepared the botanical part of that report, it was a matter of interest to him, not to say surprise, to see it take this expression. It has never fallen to our lot to be so puzzled by a schoolbook dealing with botany. It is a puzzle both as to its botany and as to its pedagogy. It claims to be adapted for use in elementary courses, but there is no adequate explanation of the terms used or of the structures or functions to which they apply; the terminology is utterly confusing and inconsistent; and there is no morphological thread whatsoever upon which the facts may be strung.

The author seems to have obtained a multitude of facts, but they are as incoherent as a sand bank; and what is worse, the essential structures are most frequently omitted. This is notably true in the treatment of the spermatophytes, where the morphologically important structures of the lower groups are entirely dropped, and the work is confined to the histology of the

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[2] CLARK, CHARLES H.—A laboratory manual in practical botany. Small 8vo. pp. 271. *figs. 191.* New York, Cincinnati, Chicago: American Book Company. 96 cents.